REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed April 30, 2002. Claims 9-16 were rejected. Claims 9-16 have been canceled without prejudice. New claims 17-30, including independent claims 17 and 24, have been added to address the concerns raised by the Examiner. Claims 17-30 remain in the application.

Claim Objections and Rejections:

The Examiner raised objections and rejections to all previously pending claims 9-16. However, as Applicant believes that newly added claims 17-30 address and cure any defects which may have been present in the previously pending claims, Applicant will not herein provide detailed responses to the Examiner's previous objections and rejections.

New independent claim 17 is directed to an enhanced volume phase grating assembly, including the limitations of discrete ranges of material properties all cooperatively selected to provide high dispersion, low polarization dependent loss, and uniformly high diffraction efficiency across substantially all of the wavelength range of the wavelengths of signals being processed by the phase grating assembly. These limitations include an angle of diffraction, θ, that is greater than 30 degrees; an effective thickness, T, that is less than 30 microns; a bulk refractive index, n; and a peak modulation value, Δn, of the bulk refractive index that is greater than 0.1. Neither the Jannson reference nor the Kato reference teach or suggest providing a volume phase grating assembly in which these various parameters are cooperatively selected to provide the benefits of high dispersion, low polarization dependent loss, and uniformly high

7

diffraction efficiency across substantially all of the wavelength range.

Support for these claim amendments is found in the detailed description as filed, particularly in the material presented in the pages beginning on the fourth page of the detailed description through the ninth page of the detailed description (as filed). By simultaneously establishing these various parameters, an enhanced volume phase grating assembly is provided that maximizes all three of the desired properties outlined in the second full paragraph of the sixth page of the detailed description. In addition, a fourth requirement, that of providing the aforementioned three properties across substantially the full width of the waveband, as discussed in the first full paragraph of the 8th page of the detailed description, is also met by these parameter ranges.

In addition, newly added independent claim 24 is directed to an enhanced volume phase grating assembly having a volume phase medium material with material properties including an internal angle of deviation, 2θ, and a Kogelnik parameter, υ. The volume phase medium of claim 24 also includes the limitations of an S diffraction efficiency, Es, defined by the equation $Es = \sin^2\upsilon$, and a P diffraction efficiency, Ep, defined by the equation $Ep = \sin^2(\upsilon\cos2\theta)$. Respective values of 2θ and υ of the volume phase medium material are selected such that Es and Ep are both simultaneously established to be greater than about 90%, to thereby provide high dispersion, low polarization dependent loss, and uniformly high diffraction efficiency across substantially all of the wavelength range.

Neither the Jannson nor the Kato reference teach or suggest such a volume phase grating assembly. Support for the newly added claim 24 is found in the specification as filed in the fourth and fifth pages of the detailed description, particularly in equation (1), equation (2) and

equation (3). The resulting Ep and Es curves are illustrated in FIG. 10, where it can be seen that both Ep and Es are greater than about 90% across the entire wavelength range, in this embodiment 1530 nm through 1570 nm. By selecting respective values of 2θ and υ to simultaneously substantially maximize both the Ep and Es values, a volume phase grating assembly is provided that simultaneously provides high dispersion, low polarization dependent loss, and uniformly high diffraction efficiency across substantially all of the wavelength range.

None of the limitations present in the newly added independent claims are taught or suggested by either Jannson or Kato.
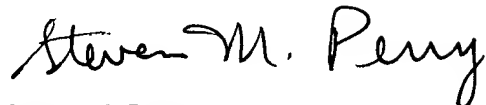
CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 17-30 are now in condition for allowance. Accordingly, Applicant requests that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call the undersigned at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

Check No. 16904 , is included in the amount of $1,025 pursuant to 37 C.F.R. § 1.17(m) for a Petition for Revival of an Application for Patent Unintentionally Abandoned under 37 C.F.R. 1.137(b), and pursuant to 37 C.F.R. § 1.17(e) for a Request for Continued Examination under 37 C.F.R. 1.114. The total number of independent claims is two and the number of total claims is 14. Therefore, no additional fee is due.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this __7__ day of __May__, 2003.

Respectfully submitted,

Steven M. Perry

Steve M. Perry
Registration No. 45,357

THORPE NORTH & WESTERN, LLP.
P.O. Box 1219
Sandy, Utah 84091-1219
Telephone: (801) 566-6633

SMP/JRJ:kj
H:\FILES\21000\21720\21720 RCE Response.doc

10